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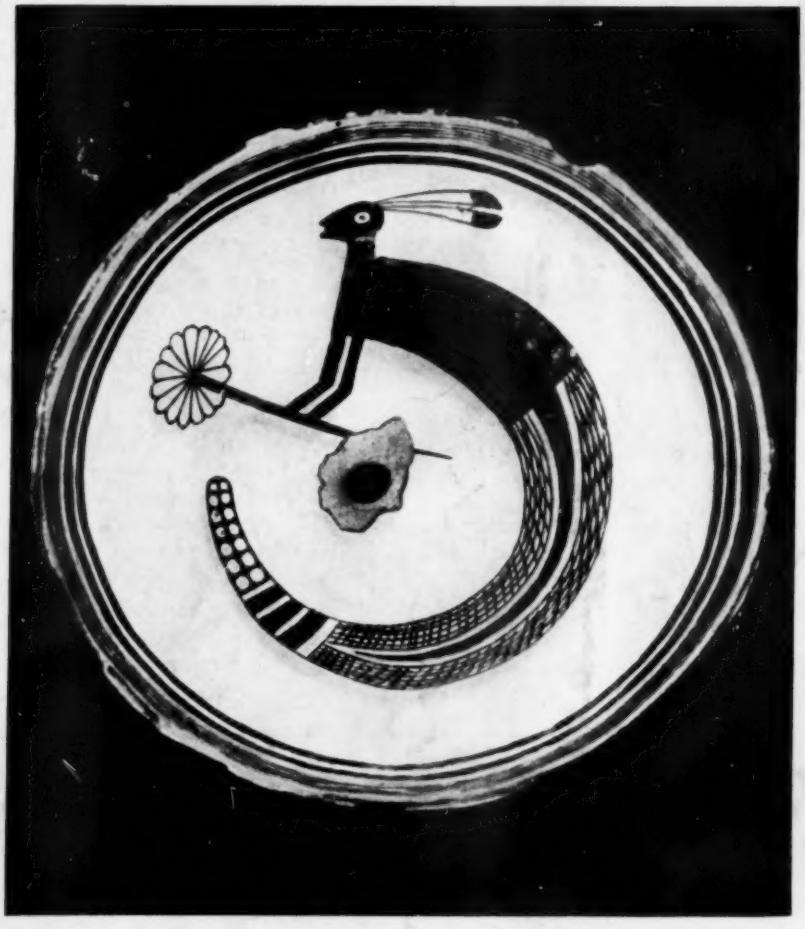
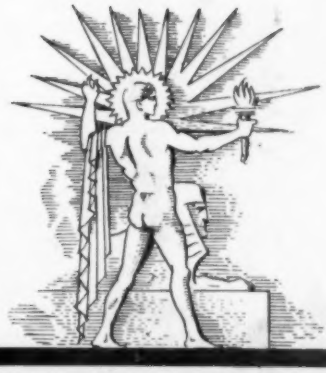
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





April 2, 1938

Rattlerabbit

See Page 214

A SCIENCE SERVICE PUBLICATION

Do You Know?

Piano keys can be made of plastics in place of the usual ivory.

Sap of the upas tree is still used by Malay natives to poison arrows and darts.

Live goats and even bulls have been let down by parachutes from airplanes, to transport fresh meat to Italian troops in Ethiopia.

Children who have many spells of illness do not seem to be affected in their growth by it, judging by measurements of over 400 boys and girls.

One North Carolina miller uses his home-made, water-driven machinery for grinding corn and also for cutting and polishing Carolina's gem stones.

Eating acid fruit and milk together is not harmful, nutritionists say; milk curdles anyway when it comes in contact with acid gastric juices of the stomach.

The most famous Roman road, the Appian Way, ran 412 miles toward the East, and has been called as startling a muscle-power achievement as the pyramids of Egypt.

Colors are important in grading and classing cotton, fruits, vegetables and other agricultural products; and in the Department of Agriculture's color laboratory the work is done by filtered artificial light which closely matches average daylight.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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Are tanks invincible? p. 213.

UNNATURAL HISTORY

Why is the tripodero feared? p. 214.

Watermelons are proving useful to scientists studying factors of plant heredity.

In the past 25 years, cancer has advanced from seventh to second place among causes of death.

The first residence ever lighted by electricity was the boarding house at Menlo Park, N. J., where Thomas Edison lived.

A journal devoted entirely to airships has appeared in London.

Out of 21 civilizations that have arisen since the dawn of history, 14 are known only by their ruins.

China's Grand Canal, nearly 1,000 miles long, was for a long time the only line of communication between north and south China.

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RADIO

Radio Amateurs Will Attack Home Television Problem

With Development of Cathode Ray Tube and Receiver Parts on Market, "Hams" Are Ready to Renew Experiments

HUNDREDS of devoted radio amateurs, who attempted unsuccessfully ten years ago to bring the television of the old mechanical scanner out of the laboratory into the home, are getting set these days for another assault on the problem.

They are known to the public only as the enthusiastic men who stay awake long hours talking to distant brother fans whom they cannot yet see and rarely know, and who render yeoman service when disaster pulls down telephone and telegraph wires. But they are also active experimenters. They are preparing to go forward again on the basis of new methods worked out in America's radio laboratories in the past decade.

Under the leadership of the American Radio Relay League, premier organization of the 48,000 licensed amateurs in the United States, they are ready to serve as sight-and-sound transmission's proving ground, as they served the talking wireless twenty years ago.

With them rests an important share in determining the answer to today's radio question: How soon will we have television and how cheap will it be?

Recalling their bitter experience of ten years ago when they believed vainly that satisfactory progress could be made by use of the whirling disc that converted picture into signal, they have gone slow during recent years.

But now it is felt that the development of the cathode ray tube, outstanding television improvement, and the recent placing of television receiver parts on the market, justify renewed interest.

In centers near experimental television transmitters, "hams" who are used to long hours bending over their complicated wire and tube assemblies will as a result soon be putting together home manufactured television receivers.

Out of their experiments, James J. Lamb, technical editor of QST, the A. R. R. L.'s official organ and the amateur's monthly "bible," declares, will come thoroughly tested equipment. Just as fifteen and twenty years ago, the "hams" took the "bugs" out of early sound receivers, they will eliminate many of the troublesome kinks from television.

One-third of QST's 43,000 readers have asked the editors of the magazine in a poll to publish material covering thoroughly the latest in television theory and practice.

Marshall P. Wilder, Station W2KJL, a leading amateur and a leading television student as well, is serving as "teacher" in this new undertaking. He is author of a series of articles now running in QST on how television works and on what the amateur can do about it.

In addition, for the first time vital parts such as the cathode ray tube, which converts electric signals into electron beams which paint the picture on the flat end of the tube, are available to whoever wishes to buy.

Amateurs are saving dimes and dollars, for television will be an expensive proposition. One model of cathode ray tube will cost $40, another slightly larger one $60. For the time being at least there will be no amateur transmitters, for sending sight-and-sound signals is far beyond the reach of the average "ham."

Amateurs have stayed away from television during the past decade because of their sad experience during the late 'twenties. In 1929, QST wrote finis to the fan's efforts and expenditure of time and money with two debunking articles, "Rotten Television" by the late Hiram Percy Maxim, inventor of the Maxim silencer, and also president of the A. R. R. L., and "What Price Television" by M. B. Sleeper.

"It was not until about a year ago, in the fall of 1936," Mr. Lamb states, "that television had reached a stage where we became convinced that our active experimentation would not be much longer delayed. Technique in the art had reached the state where refinement rather than new basic developments had become the ruling order."

Back in the days of the 'twenties, television still used almost exclusively the crude mechanical scanner. A whirling disc with holes arranged in a spiral passed a beam of light over the scene

TESTING

Marshall P. Wilder, radio amateur, television student and a guide to many "hams" interested in television, tests an experimental superheterodyne type receiver, a model developed by him. Mr. Wilder, Station W2KJL, is in his laboratory in Newark, N. J. Building and operating television equipment is ticklish business, he advises; only expert radiomen should attempt it.

EXPENSIVE

A cathode ray tube, used in television receivers. Electrons paint the image on the fluorescent screen, white in the picture, at the end of the tube. Amateurs buying cathode ray tubes pay $40 for a tube giving a three-inch by five-inch image.

being televised. The varying beam of light reflected by differently shaded parts of the scene passed to a photoelectric cell, where it was converted into an electrical signal impressed on the radio waves. The receiver used a similar setup, but in the reverse direction.

But since that time, the cathode ray tube receiving and sending schemes have replaced the ponderous whirling discs. Now electron beams translate the image into signals and back into an image again.

Television fans are at present limited to New York, Philadelphia and Los Angeles, for these are the only areas in which television broadcasters are operating. But transmitters are in prospect for Boston, Albany, N. Y., Bridgeport, Conn., and Kansas City, Mo.

"Looking in" on television is confined to those areas because the ultra short waves which carry the sight signals travel only as far as the horizon. These waves have many of the properties of light, traveling only in straight lines being one of those properties. Broadcasts from the NBC station atop the Empire State Building, for example, can be picked up only within a radius of 50 miles.

But the amateurs, come what may, are interested again. And, they say, they're in television to stay.

Science News Letter, April 2, 1938

ENGINEERING

Two Airplane Manufacturers Developing Diesel Engines

TWO of the greatest airplane manufacturers in the United States are hard at work on a highly confidential Army and Navy project looking toward the development of Diesel engines for American military and naval airplanes.

The Wright Aeronautical Corporation of Patterson, N. J., and the Pratt and Whitney Aircraft Company of East Hartford, Conn., are both engaged on the project.

The development, it is believed, is aimed at producing engines capable of developing 2,000 horsepower or more. Civil aviation, which has had the use of powerful Army and Navy engines shortly after they were placed in production, is expected to benefit from the project.

Unusual interest is attached to the project in aeronautical circles because of the fact that the present type of gasoline engine used in this country is believed near the limit of its development. The largest gasoline engine in American use is the Wright 1500 horsepower engine with which the six Boeing Clippers, now building at Seattle, will be equipped.

The two companies are believed to be carrying on their research projects separately, although in close cooperation with government authorities, as they have been competitors for years.

Advantages of the Diesel stem not only from the more powerful engines of this type that can be built, but also from the fact that no fire hazard exists and that since each cylinder is an independent unit, it can keep functioning even though one part may be damaged. Elimination of the fire hazard is of importance when the high mortality of military aircraft from fire is recalled.

Although construction of production model engines is still a matter of the future, it is believed that some of the $15,000,000 allotted in the Naval Bill just passed by the House for prototype construction will go into the Diesel project now being worked on.

Science News Letter, April 2, 1938

RADIO

New Television Parts Placed On Sale

ADDITIONAL parts for the construction of television receivers are ready for sale to interested amateur radio operators, the Radio Corporation of America has announced.

The new parts listed for sale include a deflecting yoke, two power transformers, a vertical output reactor, a vertical oscillation transformer, a horizontal oscillation transformer, a horizontal output transformer, two power supply capacitors and a power supply reactor, it was stated.

Sale of the parts does not mean the placing of commercial television receivers on the market, RCA emphasized, but it is in line with the radio industry's policy of making equipment available to qualified amateurs.

Science News Letter, April 2, 1938

GENERAL SCIENCE

About Cent Out of Dollar Spent For Research Work

RESEARCH is the lubricant that makes the wheels of civilization turn faster. Without it, industry and agriculture would not accelerate but would slow down and perhaps even stop altogether. The financial support of research is therefore important. It is a matter of more than idle curiosity as to how many dollars are being spent for research, dollars plowed back into our workaday world to produce more scientific dividends in dollars and better living.

In good round figures, somewhat over a cent is spent for research out of each dollar grossed by U. S. manufacturing and agriculture, according to figures collected from a score of sources. Industry spends more than agriculture, 1.7% (some $250,000,000) out of the $14,690,000,000 gross manufacturing income of 1936. Agricultural research, almost wholly by state and federal institutions, used 0.37% or some $35,600,000 of the estimated $9,530,000,000 cash farm income and value of home consumed farm products combined.

In terms of population, the total for research expenditures in these two great fields is only a couple of dollars per person in the U. S.

When such compilations are made, the question arises as to what to include in the figures for research. The historian who is looking into some problem can rightly say he is engaged in research. But the figures quoted are largely for inquiries and developments in the physical and natural sciences, the fields in which chemists, physicists, engineers, biologists, etc. work.

Chemical concerns practice research to a larger extent than the average. Here are some reports: 2.3% of net sales; 2.4% of gross sales; 5% of net sales; 7% of net sales, etc.

Medicine and health fields see considerable expenditures for research, the results of which are mostly measured in better health and less human suffering.

Research pays magnificently, often thousands of per cent. in dollars and more in gains to civilization.

Data from "Expenditures for Agricultural and Industrial Research Compared" by Howard P. Barss, Office of Experiment Stations, U. S. Department of Agriculture. 6 p. Order Document 1062 from the American Documentation Institute, 2101 Constitution Ave., Washington, D. C. remitting 26c for microfilm and 80c for photoprint copy.

Science News Letter, April 2, 1938

SEISMOLOGY

Earthquake Reported Near British Columbia Coast

AN EARTHQUAKE occurred near the coast of British Columbia on Tuesday, March 22, at 10:22.3 a. m., EST, seismologists of the U. S. Coast and Geodetic Survey stated after examination of data transmitted through Science Service by ten observatories. Location of the epicenter was in 53 degrees north latitude, 131.8 degrees west longitude. This point is in Skidgate Inlet, on the west side of Hecate Strait, in the Queen Charlotte Islands. A very severe earthquake was recorded from the same region several years ago.

Stations reporting data were: University of California, Berkeley, Calif.; Seismological Observatory, Pasadena, Calif.; Dominion Meteorological Observatory, Victoria, B. C.; Franklin Institute, Philadelphia; Canisius College, Buffalo, N. Y.; Williams College, Williamstown, Mass.; St. Louis University, St. Louis, Mo.; Georgetown University, Washington, D. C.; Manila Observatory, Manila, P. I., and the observatory of the U. S. Coast and Geodetic Survey at Sitka, Alaska.

Science News Letter, April 2, 1938

TACTICS

Value of Tanks Questioned By Italian Military Writer

Experience in Spanish War Declared Disappointing; Light Tanks Vulnerable, Heavies Can't Shoot Straight

TANKS, hailed as the one major military invention of the World War, are already on the way out, in the opinion of Lieut. Col. Emilio Canevari, Italian writer on military subjects (*Army Ordnance*, March).

Tanks scored their great success against the Germans, the Italian writer holds, because German manpower had been badly depleted and what was left was of inferior quality and shaken in morale. Similarly, in early actions in the present Spanish war, tanks frightened and broke the Government militia while the men were still raw and inexperienced. But after they had learned the business of fighting, the tanks got decidedly the worse of the argument.

Light tanks, that can make speed and get into places, are mere traveling tinpots, easily subject to fatal puncture by heavy machine-guns firing armor-piercing ammunition. Heavy tanks have to keep moving, for as soon as a tank stops, field guns promptly find it and end its career. And even while they are still under way the lumbering "heavies" can be put out of action by 37-millimeter guns and even by the new anti-tank guns of only about half that caliber.

Infantry Destroy Tanks

Furthermore, a moving heavy tank is of relatively little effectiveness, except as a flame thrower. It shakes and lurches so much that its machine-guns and light cannon lose most of their ammunition into either air or earth. Infantry have learned that at close range a heavy tank need not be feared, and in Spain the Government troops have been ruining them by exploding grenades in their tractor treads, or pouring gasoline on them and setting fire to it.

Col. Canevari likens tanks to the heavy cavalry of old-fashioned warfare. These cuirassiers and dragoons could be loosed in thundering charges to complete the demoralization and destruction of troops already defeated in action by artillery and infantry. But if launched against unshaken infantry the heavy horsemen only went to their doom, as Napoleon's desperately launched regiments did at Waterloo.

Development of the present heavy Russian tank into a self-contained armored artillery unit containing its own ammunition is seen by Col. Canevari as a possible continuance of the experiments with tanks, which he noted have not been satisfactory. But as a piece of movable artillery, such a tank would be used behind infantry rather than ahead of it, he points out.

Mechanization a Dream

But the completely mechanized army, subject of absorbing military fantasies during the past few years, has never been an actuality, will never come into existence and has been doomed by the experiences of the Spanish Civil War, Col. Canevari declares. He finds that earlier pictures of large mechanized bodies of troops, every man operating a tank or another piece of mobile lethal machinery, are not borne out by Spanish military events.

Nor is motorized transport possible in the fighting zone, for motorized units are tied to the highways on which they roll. Destruction of the highways by skillfully retreating enemies can cause havoc to motorized attackers. Bogged down by bad roads, they are an easy victim of attack planes.

Concluding his study of the 20 months of fighting that have seen everything from guerilla fighting to mass frontal assaults, the Italian observer finds that the advantage still lies with the defense, largely because of the ease of building obstacles to an advance and because of the development of rapid-fire arms. Whether Col. Canevari, now in the army reserve, bases his observations on actual service with Italian troops in Spain is not stated.

Science News Letter, April 2, 1938

Traces of black, brown, and red color on the Egyptian pyramids have been studied by a British scientist, who concludes these are not traces of ancient paint on the pyramids, but are natural coloring derived from the stone itself.

UNNATURAL HISTORY

You Don't Have to Believe It

Hunger, Thirst, Sun, Fatigue, Strange Food and Drink And Just the Love of a Tall Tale Produce Wierd Beasts

By RONALD L. IVES

See Front Cover

"—and you know, that cave actually blows smoke rings, once every thirty-four minutes—"

ANOTHER traveler is recounting the wonders of his latest expedition into the hypothetical wilds, equipped with a good imagination and plenty of snakebite medicine. Today, we smile indulgently at these traveler's tales, but not so long ago, each and every yarn was carefully remembered, and passed on (sometimes "improved" a little) to the next avidly listening ear.

Perhaps the "tall story" is a racial heritage of the days when there was no writing, and wandering minstrels were our newspapers and sources of information. Primitive tribes still retain their histories as legends, passed on by word of mouth from father to son.

Theses on Paul Bunyan

Today, however, the "tall story" is a part of our literature. Newspapers run "whopper" columns, paying a rather good price for each new tall tale. Several hunting and fishing magazines publish the wildest possible stories sent in by their readers, and the doings of such legendary characters as Paul Bunyan and Juan Catorce are the subject of Ph.D. theses and massive tomes.

Guides in the wilder parts of the country still collect and tell wild tales of wilderness and mountain country to the "dudes," "palefaces," and "flatlanders" who each year leave their inhibitions and intellects in the city and spend two glorious vacation weeks collecting sunburn, poison ivy and mountain sickness.

Old books tell us of the wonders of the ancient world, of the dragons, the sea monsters, and the centaurs. We do not believe these tales today, but many a "paleface" has slept timidly in a screened tent from fear of the dreaded "hydrophobia skunk" of the southwestern deserts.

Wide-eyed tourists listen around the desert campfires to the sad tale of Rot-Gut Pete, who vanished between Salome, Arizona, and his cabin one gloomy night. It seems that Pete had been celebrating something or other at the Last Chance Saloon, and left shortly after midnight with three sheets in the wind and no pilot. A few days later, when Pete showed up missing in his regular haunts, a search party tracked him out into the desert.

Finally, at the base of a very large flycatcher plant, the searchers found a watch, forty-two boot nails, eleven buttons, a six-gun, a belt buckle, and two silver dollars. They identified the gun as Pete's by counting the notches. Pete, it seems, had leaned against one of the giant flycatcher plants, and the thing had closed on him. Later, when the plant was gorged, it had opened again, dropping the metallic debris on the ground. You have to be very careful out in the desert!

The Northland, too, has its tales, and some of them were never immortalized by Robert W. Service. Strangest among the pseudoscientific discoveries are the furred salmon, reported from the Coppermine River. It seems that the waters of this Arctic river are cold, and the fish there, after generations of freezing, finally evolved a furry coat to protect them. Now, snug in their fur coats, the salmon gaily plunge in the ice-rimmed pools of the river, and their fur is much prized by the Eskimos, who use it for money. Not so many years ago, a questionably famous Arctic explorer is reported to have spent a summer hunting these strange fish in the high-altitude lakes of Glacier National Park.

Tripodero, Texas Terror

The Texas plains, it seems, are cursed with the presence of a perambulating putty-blower, locally called the tripodero. It seems that the tripodero is ideally adapted for life in the chapparal country. Its legs, like those of a photographer's tripod, are extensible, so that it may rise above the chapparal and look for food. With the legs shortened, it can run under the brush without trouble. By generations of evolution, the tripodero has developed a special hunting method. Living by sucking the juices out of its prey, its jaws have grown together, resembling a funnel. When it feels hunger coming on, the tripodero sucks up a mouthful of clay, which it rolls into pellets with its tongue. Later, when the next meal is found, the tripodero blows a pellet at its prey with terriffic force and marvelous exactness. Soon it sucks the juices from the animal and goes out in search of more.

"But Mr. Guide, is that true?"

"Sure, madam, didn't you see that dead cow today beside the trail?"

"Yes."

"Well, that was plumb sucked dry, wasn't it?"

"Yes—it was!!!!" It may be years before the paleface learns that this is just another guide's tale.

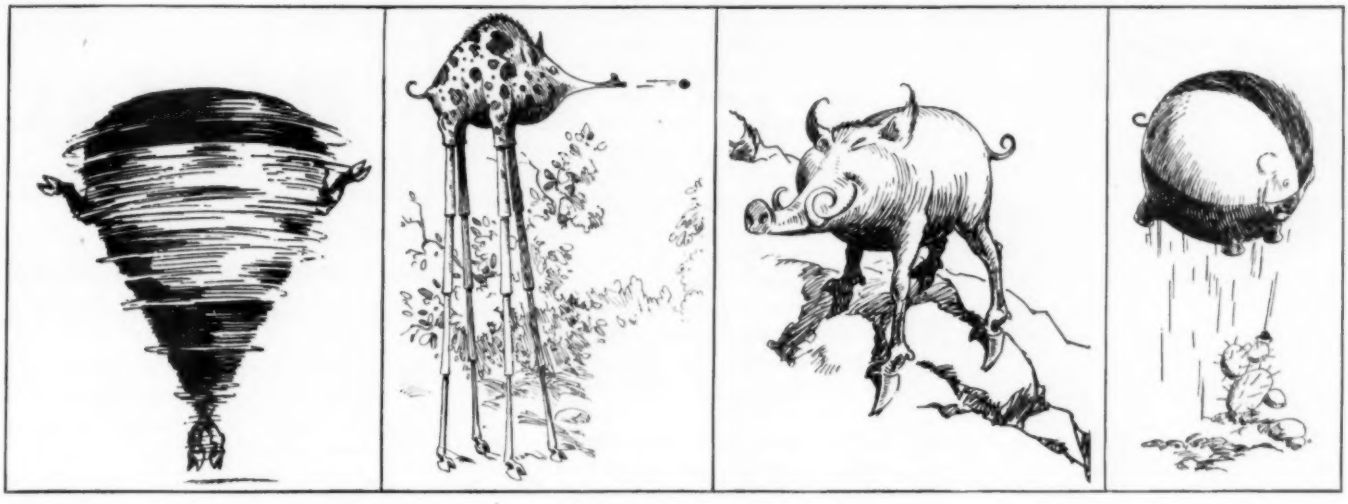
Jersey Devil Repealed

Northern New Jersey was cursed for years by the appearance of a very terrible monster which defied description. It was reported as the "Jersey Devil" and was a source of considerable worry until someone discovered that the "Jersey Devil" always appeared just after the annual supply of illicit applejack was distributed. Recently, the Jersey Devil has been conspicuous by its absence.

Hunters in the wilds of Bear Mountain, New York State, only a few hours drive from the big city, have suffered the loss of many valuable hunting dogs from the evil machinations of the hodag, a fearsome beast, never seen by man, who lives on a diet of young dogs, each carefully dunked in liquid mud. Attempts to catch this fiendish creature usually end up with a terrible hangover.

Mountaineers have their own special menagerie of weird creatures, and tales of these strange animals are usually told while the guide warms up for an account of how his partner fell off a mountain two miles high last year, and splashed all over the landscape when he hit the rocks. The accident stories may be true, but a standing offer of $100 for a good picture of the rackabore, one of the most commonly reported mountain animals, has been withdrawn after five years because nobody claimed it.

The rackabore, according to guides who claim to know, evolved many generations ago from the javelina, a piglike animal that lives on the plains. It seems that the javelina population of the plains became too great for the food supply



IMPROBABLE QUADRUPEDS

Noah never saw anything like these on the Ark—though he may have glimpsed them later, after his famous misadventure with home-made wine. Left to right: the Whirling Whimpus, which nobody ever sees because it spins too fast; the Tripodero, extended, in firing position; the Rackabore (left-footed model); the Rubberado, which bounces when shot, and makes an incurable bounder out of anyone who eats it. Drawings by courtesy of Outdoor Life.

during one of the early ice ages, and some of the javelinas were forced to move into the hill country. There they developed special legs for hillside travel, short on one side and long on the other. Guides report both "right-handed," and "left-handed" rackabores, which sometimes mate to produce other wonders, most of which go unseen by credible witnesses.

Obstinacy, according to the guides, is a very strong trait among the rackabores. Once, many years ago, two rackabores, one right-handed, and one left-handed, met on a narrow trail overlooking Grand Lake, Colorado. Neither could turn, and neither would retreat, so that both starved to death on the trail. The two skeletons are now hung in a tree in a college surveying camp, where all may come and see. The bones have a strangely equine appearance.

During the early days, when the Spanish were pushing their New-World empire north from Mexico, strange and wonderful things were encountered. It was then that Pedro Martyr wrote his justly famous *De Orbe Novo,* in which he collected all the tales available to him. In it we find accounts of the famous Island of the Amazons, visited only once a year by men, and of the giant king Datha, who, in his youth had been oiled and stretched daily. Details of the wonderful land of pearls were recounted, and the gold mines of Chicora were first described. Strangely, much stock has been sold in these gold mines, and the area seems to have been the Carolina region, which today produces gold in commercial quantities.

Lost Lake of Mercury

Fray Pedro de Escobar, a member of the Onate expedition of 1604, collected many accounts of strange and wonderful beings who lived on the shores of the Gulf of California, then generally believed to be the strait which separated the mythical kingdom of Anian from the mainland of America. Escobar tells of the tribe of unipeds who lived to the northward. It seems that these strange creatures were built on the same general blueprint as men, except that they only had one leg and hopped about in search of food. Somewhere in the still not-too-well-known desert country of the Southwest there was reputed to be a lake of mercury, which shimmered in the desert sun. Apparently this lake has dried up, for no trace has been found of it in recent years.

Strange and wonderful creatures lived in the wilds of Lower California, according to the old chroniclers. One group had ears so large that they used them for umbrellas, while other tribes, called the Patagones, used their feet for the same purpose. One very scholarly reporter tells of a race of tailed men. These tails were so stiff that when the tribesmen wanted to sit down they had to use chairs with open seats. Several tailed men have been reported during the history of the earth, but a whole tribe of them has never been encountered.

Food was very distasteful to some of the mythical tribes of the new world, and they gained their nutriment by inhaling odors of various kinds. Other savages lived wholly under water, even sleeping there—possibly to avoid the bad night air that was reported from the early 1500's.

Even the ancient Indians had their imaginary creatures, some of which were probably the prototypes of a few reported today. The sandhill perch, recently reported from the dust-bowl area, is not a new invention. A few years ago, a prominent archaeologist, digging in the Mimbres valley of New Mexico, unearthed a grave more than 1,000 years old. Carefully placed over the skull was a beautiful pottery bowl, and on it, painted skilfully and in much detail, was a fish, easily recognized as a catfish, which two men were dragging along the ground. The fish, as suits an animal that lives on land, had four perfect legs. It was about as big, as judged from the sizes of the captors, as the modern fish that get away.

Mimbres Valley Surrealism

Surrealism seems to be related psychologically to the "tall tale." Mimbres Valley people of 1,000 years ago suffered from that, too. On one of their bowls is painted a perfect "rattlerabbit," whose body to the waist is that of a rabbit, but whose tail belongs to a rattlesnake.

Every old map is shown complete with a galleon sailing on the ocean, and a sea monster lying in wait for luckless seamen. We laugh at this naive belief, but not long ago a group of scientists spent considerable money investigating the Loch Ness monster reported from Scotland. Even today, a request for funds to be used (*Turn to Page 222*)

BIOLOGY

Struggle to Gain Support For Biological Abstracts

A VIGOROUS struggle is in progress to keep alive *Biological Abstracts,* the publication that for eleven years has summarized and brought into reference form the contents of hundreds of journals in the biological sciences the world over.

A group of younger biologists, headed by Prof. George W. Hunter III, of Wesleyan University, Middletown, Conn., are making, as a duty to science, an attempt at creating sufficient financial support to allow *Biological Abstracts* to continue during 1938 and 1939.

Of a minimum of $43,000 necessary to publish during 1938, somewhat less than $21,000 in subscriptions was in hand at the last report. A plan was devised whereby libraries of scientific institutions would pay for subscriptions according to the number of biologists in the institutions, the subscriptions ranging from $25 for those having up to three biologists to $200 for those with over 51 biologists. This met some opposition among librarians.

Prof. Hunter and Dr. J. E. Flynn, new editor of *Biological Abstracts,* are urging upon their fellow biologists the fact that it will be easier and cheaper to strengthen an activity than to resurrect a dead one at a later date.

Biological Abstracts has had the financial support of the Rockefeller Foundation in past years, and its offices are located in the University of Pennsylvania.

Science News Letter, April 2, 1938

ARCHAEOLOGY

Music Was Advanced Art In World's Oldest Cities

MUSIC was an amazingly advanced art in the world's oldest cities in the valley of the Tigris-Euphrates.

Five or six thousand years ago, Sumerian shepherds piped pleasing melodies. So we infer from archaic pictures in which the shepherd's dog sits listening attentively to his master's voice.

Sumerians at royal banquets were entertained by professional singers. Proof is a picture unearthed at Ur of the Chaldees, dating from about 2700 B.C. At the end of a row of diners stands a harpist, and with him a lady singer, her hands clasped before her chest in true operatic manner.

Most important of all, Sumerians had music at religious rites. Trained choirs sang hymns. Psalmists chanted petitions. String orchestras and ritual drums accompanied the voices.

To take account of new evidence unearthed in Near Eastern ruins, Dr. Francis W. Galpin, Canon Emeritus of Chelmsford Cathedral, has completed a volume on "The Music of the Sumerians, Babylonians, and Assyrians."

He even finds in music a clue to the origin of the Sumerians.

One theory "put forth with insistence," he says, would have the Sumerians coming to Mesopotamia from Abyssinia and Somaliland. But their music argues against an African origin, for they did not bring Egypt's early musical instruments. Instead, their chief ritual instruments were harp, drum, and flute, all Asiatic.

The lyre in primitive form was probably already known in Mesopotamia when the Sumerians arrived. Lyre and timbrel were characteristic of Semitic music, and some Semites were in the land.

The blowing horn used in Sumerian magic rites came from uplands of Asia, perhaps brought by Sumerians themselves.

Altogether, their music upholds the theory most widely accepted—that the clever Sumerians came from hill country east or northeast of Mesopotamia when they established themselves for 3,000 years of occupation in the valley of the two rivers.

Science News Letter, April 2, 1938

GEOLOGY

Volcano Under Glacier Gives off Fluorine

FLUORINE gas, super-corrosive vapor that dissolves even glass, given off in quantities by Iceland's subglacial volcano, sickens sheep and humans in its vicinity, reports Dr. H. Vigneron (*La Nature.*) Lesions of the membranes of the nose and mouth are caused by the gases, he states.

Acting like a giant calorimeter, or device for measuring the heat given off by a fire, Vatnajokull, the crater under the ice, supplies geologists with a rather accurate measure of the energy of a volcanic eruption. From the amount of ice melted away from the Icelandic glacier, they can tell quite closely the amount of heat given out by the volcano. To date, this eruption has melted several cubic miles of ice. Now, it is becoming quiescent, but another eruption is expected in about 1945-50, judging from the past behavior of the crater.

Science News Letter, April 2, 1938

IN SCIENC

ANTHROPOLOGY

Do You Outgrow Your Hats? Science Wants to Know

YOU needn't be ashamed if your head grows too big for your hat. It's no sign of a swelled head. Instead, it means your brain is still growing.

But whether most people do get brainier in this way, in adult life, is something Dr. Ales Hrdlicka, anthropologist of the Smithsonian Institution, would like to know. Dr. Hrdlicka has asked that any one who has any significant record or observation of his, or her, hat sizes in adult life send reports to him.

Dr. Hrdlicka would particularly like reports from women, and from men who are business men, bankers, writers, and other types, non-scientific.

His first call for information on head growth during adult life has brought in 20 answers. Nearly all have come from scientists. Some say specifically they had to buy bigger hats after years of exceptional mental exertion.

Dr. Hrdlicka has some evidence that women who do highly intellectual work may have larger heads, contrary to the usual female head type which is smaller than the male.

The anthropologist does not find that the bigger the brain the brighter the mind. He does find that, generally speaking, a group of brain workers have larger heads than a group of laborers.

Science News Letter, April 2, 1938

ENGINEERING

Flood Control Studied At Cornell University

FLOOD control is being made the subject of intensive study at Cornell University in collaboration with the U. S. Army Engineer Corps.

Special attention is being focussed on the situation in southern New York and northern Pennsylvania, where disastrous floods occurred in 1935 and 1936. A model of the Chenango valley through Binghamton, where the damage was greatest, has been built and has yielded data of importance for use in new control works. (*Science,* Mar. 11)

Science News Letter, April 2, 1938

NCE FIELDS

AVIATION

Patents Holes-in-Wing To Cut Plane Landing Speed

AN INGENIOUS suction method for simultaneously slowing the landing speed of a high speed plane and increasing the lift of its wings is revealed in a patent granted to Major Alexander P. de Seversky, New York designer of high performance military aircraft.

Ports placed near the leading edge of the wing connect with suction ports on the under side of the wing toward the rear. Suction thus created simultaneously slows the ship and cuts turbulence on the upper side of the wing, the inventor explains, thus increasing lift.

Slowing by one means or another the extremely high landing speeds of military aircraft is a problem of growing severity and interest to aircraft designers, it will be recalled.

Science News Letter, April 2, 1938

PUBLIC HEALTH

Next War Will Find U. S. Lacking in Health Officers

THE next war will find the United States hard put to it to protect its fighting men from disease. This is the opinion of the editor of the *American Journal of Public Health* (March).

The difficulty is that there are not enough qualified sanitarians, trained in disease prevention, among the reserve officers who would be called up in time of war.

The number of officers in the Sanitary Corps Reserve is 422, War Department figures show. Of these, only about 100 are qualified sanitarians, says the health journal.

"While the medical officers of the regular army are familiar with sanitary procedures, those of the reserve corps are, in general, practitioners of curative and not preventive medicine," the editor comments. "Much of the responsibility for sanitary measures during mobilization and combat will, therefore, devolve upon the members of the relatively small Sanitary Corps."

When the next war comes, a vast army of young men, all more or less susceptible to various diseases, will be assembled suddenly in hastily prepared camps. Protecting these men from disease will be an acute problem in public health, it is pointed out. An expert and extensive sanitary organization will be needed at once to insure adequate supplies of pure water, proper disposal of sewage and waste, elimination of insect carriers of disease, supervision of hygiene of housing and ventilation, safety of food supplies and control of other matters of environmental sanitation.

Science News Letter, April 2, 1938

GEOLOGY

Nation's Oil Storehouse Is Silt of Vanished Sea

SILTS of a sea that is no more, sea foods of the age of dinosaurs, and the earth movements that made this ancient ocean into our western plains, were described to the American Association of Petroleum Geologists by a group of members of the U. S. Geological Survey.

Eighty million years have passed since the great Cretaceous sea of the central part of North America dried up, and its floor slowly rose to become the high plains and Rocky Mountains. From the Mexican border to the Canadian border and beyond, evidences of this great sea are found. The story of the changes leading to its vanishment, and the relation of the former sea to present oil deposits, was told by Drs. L. W. Stephenson and J. B. Reeside, Jr.

Similar rocks, found in the southeastern United States, also of importance to the oil industry, were described by Dr. C. W. Cooke and W. H. Monroe, of the U. S. Geological Survey. A small part of this area, the Jackson Gas Field, of Mississippi, was described jointly by Mr. Monroe and H. N. Toler, Oil and Gas Supervisor of Mississippi.

Earlier rocks, underlying the ancient sea silts, were described by Dr. Philip B. King, whose studies of these Permian oil-producing beds were made in the course of his work with the U. S. Geological Survey.

Rock structures, resulting from slow earth movements, and creating the traps in which oil accumulates, were described to the oil geologists by Dr. N. H. Darton, who, although retired from active duty in the U. S. Geological Survey, keeps on working. He was elected to honorary membership in the American Association of Petroleum Geologists in recognition of his long years of active work in geology.

Science News Letter, April 2, 1938

ARCHAEOLOGY

Iliad Not in Nutshell; It's an Old Roman Mistake

EVEN if Roman author Pliny did say it, there never was a copy of Homer's Iliad in a nutshell.

For centuries, scholars have puzzled over this ancient astonishing statement, but Dr. Henry A. Sanders, University of Michigan's Latin professor, has cleared up the mystery.

Pliny was wrong, declares Prof. Sanders in the Michigan Alumnus Quarterly Review. Pliny read Cicero's statement about a copy of the Iliad "bound in nut," and he leaped to the conclusion that this was an extremely tiny book.

The Latin word "nux", however, means either nut or tree, explains Prof. Sanders, as we would say "of walnut," or "of chestnut." Cicero was really describing a copy of the Iliad bound in wood, and it was important because it was one of the first literary works bound in book form.

"If any one wished to write the 15,693 verses of the Iliad on the tiniest paper," says Dr. Sanders, "and with all modern instruments including our powerful magnifying glasses, so as to enclose it in a nutshell, he would have to use a cocoanut, and not any of the nuts known to ancient Italy."

Science News Letter, April 2, 1938

CHEMISTRY

Young Yale Chemist Wins $1,000 Award

TWENTY important scientific papers at the age of 30 is the record of Dr. Abraham White, assistant professor of physiological chemistry at Yale University, which has won for him the $1,000 Eli Lilly Award in chemistry.

A bronze medal and the $1,000 check of the Eli Lilly and Company Award in Biological Chemistry will be presented to Dr. White at the meeting of the Society in Dallas, April 18 to 21.

Dr. White has specialized in the chemistry of proteins and his most recent work is the isolation of a crystalline protein of "high lactogenic activity" from the anterior pituitary gland. He has also studied the metabolism of sulfur in the body and the roles of the chemical groups in insulin.

The Lilly award was established in 1935, to run five years, and seeks to bring recognition to outstanding young chemists.

Science News Letter, April 2, 1938

PHYSICS

Design Atomic Speed Trap To Solve Cosmic Ray Puzzles

Pair of Superposed Cloud Chambers With Lead Plates Will Slow Down and Possibly Destroy Fast Particles

SCIENCE took another stride toward understanding the ever-present cosmic ray with the discovery at Harvard University that many of the strange new particles found in the rays last year are destroyed in a split-second cataclysm which, without leaving a shred of evidence, explodes their million-volt energies.

The particles, found independently by Prof. Jabez C. Street and Dr. Edward C. Stevenson, of Harvard, and Drs. Carl Anderson and Seth Neddermeyer of California Institute of Technology, are unlike any other fundamental bits of matter. They are the most penetrating projectiles known to man. Tearing earthward from outer space at energies ranging up to hundreds of billions of volts, they can easily blast through several inches of dense, solid lead.

Energy Dribbles Off

According to Prof. Street and Dr. Stevenson, however, many of these particles dribble off energy as they collide with atoms in the atmosphere, apparently reaching a critical stage at which one single collision will stop them in their tracks and completely dissipate their great store of remaining energy.

Just when this stage is reached, why one smash-up should wreck these pile-driver projectiles, the two Harvard physicists are not prepared to say, nor are they certain exactly how these catastrophes occur. The cataclysms follow no known physical laws and are entirely unpredictable.

To answer these and other puzzling questions the pair have designed a new type of cosmic ray "telescope" and atomic "speed trap" which will soon be put into operation for better observation of the cataclysm. An automatic recording device is already photographing the paths of some fifty cosmic ray particles daily for them.

Preliminary experiments indicate that the new-found particle has an electric charge about equal to that of the ordinary atomic building blocks, the proton and the electron. Its mass, however, is about 130 times as great as that of the electron and just about one-fourteenth that of the proton. Its tremendous penetrating power, of course, also marks it off from other particles of matter. Indeed it was this stupendous force which led to its original discovery.

As Prof. Street and Dr. Stevenson visualize the cosmic ray bombardment, one of the small particles might start from outer-space with an energy of billions of electron-volts. Small amounts of this energy are probably lost through collisions with air molecules or even solid material as the particle shoots toward earth. A head-on smash-up with a lead plate might cost it a few million volts of energy per centimeter, a noticeable but by no means large loss.

Down to a certain critical energy value —possibly at several hundred million volts—the particle's energy loss apparently proceeds with fair regularity. At some as yet not accurately determined critical energy range, however, the chances are that one single collision may stop the particle altogether, exploding all its remaining energy in one lightning holocaust. This range probably extends from zero up to about four hundred million electron volts.

May Stop at Thin Plate

Thus a particle which has easily smashed through several inches of lead plate may, in this critical energy range, succumb to a sheet of lead only a third of an inch thick or even less. This has been the most puzzling aspect of the discovery for this energy loss is entirely out of proportion to other earlier energy losses by the particle. In attempting to unravel the mystery, the two scientists have been looking for possible products of the catastrophe but thus far they have been unable to find any.

The proposed attack on the problem, to be made with the new cosmic ray telescope, involves a study of the mathematical probabilities for occurrence of the cataclysm at various ranges of the particle's energy content. The two are also trying to produce one of the cataclysms right in front of a camera so that if there are any disintegration products they can be photographed.

The new "telescope" uses equipment familiar to research workers in this field although it is arranged in a significantly different way. Outstanding is the set-up of two cloud chambers with one on top of the other. In the top one a particle is photographically traced through a strong magnetic field to determine its energy and other characteristics, a standard procedure.

Then, with these instantaneously determined, the particle flies into the lower chamber where a series of metal plates is arranged to trap it, slow it down and possibly destroy it in one of these cataclysms. A camera will also record the happenings in this lower chamber and the scientists hope to obtain a picture of the disintegration. A feature of the apparatus is that it operates automatically, resetting itself after each passage of a cosmic ray.

In announcing the research the investigators pointed out the need for hundreds of photographs of the new particle since only a very small number of those reaching the earth can be used in scientific studies. Most of the particles reach earth at such stupendous speeds that they slip through laboratory speed traps and thus afford no basis for investigation.

Science News Letter, April 2, 1938

PHYSICS

New Atomic Particles Forecast in Cosmic Radiation

SCIENTISTS are now on the hunt for still another type of cosmic ray particle which is predicted by Dr. Robert M. Langer, research physicist of California Institute of Technology.

In a report (*Physical Review,* March 15) Dr. Langer suggests that atomic particles weighing from two to ten times the mass of ordinary electrons should be found in cosmic radiation.

Already, in cosmic ray studies, high-energy electrons of ordinary mass and a positive electrical charge have been identified. And also the massive "X" particles weighing several hundred times the mass of ordinary electrons have been observed and studied.

The new and yet-unfound particles would have mass intermediate between these two extremes, says Dr. Langer.

Experiments now show, Dr. Langer reports, that the initial, incoming cosmic rays appear to consist largely of positive electrons. These high-energy particles strike air atoms and from the impact

come the "X" particles. The great mass of these secondary particles permits them to penetrate deeper than the initial particles and they are found to produce most of the cosmic effects found at sea level and low altitudes.

The new intermediate-weight particles, Dr. Langer reports, would account well for the cosmic ray effects noted in high altitude experiments on mountain tops, in airplanes and in sounding balloons.

It is not necessary to postulate new particles with special behavior to explain existing observations, as has been suggested by other investigators, says Dr. Langer.

He favors the hypothesis put forward by Dr. Seth Neddermeyer of California Institute of Technology, that there can exist a whole series of masses for the electron which differ by unity. Thus it would be possible to have electronic masses just as there is a whole series of chemical elements with masses differing by unity from hydrogen, at mass one, up to uranium with mass 240. In the field of the chemical elements only the form with mass 5 is missing out of all this series.

The still-unfound electrons with masses up to 10 times that of the ordinary electron, plus the very heavy electrons already observed, would provide the first successful explanation of the way cosmic radiation increases in intensity as one goes higher up in the atmosphere, claims Dr. Langer.

Science News Letter, April 2, 1938

METALLURGY

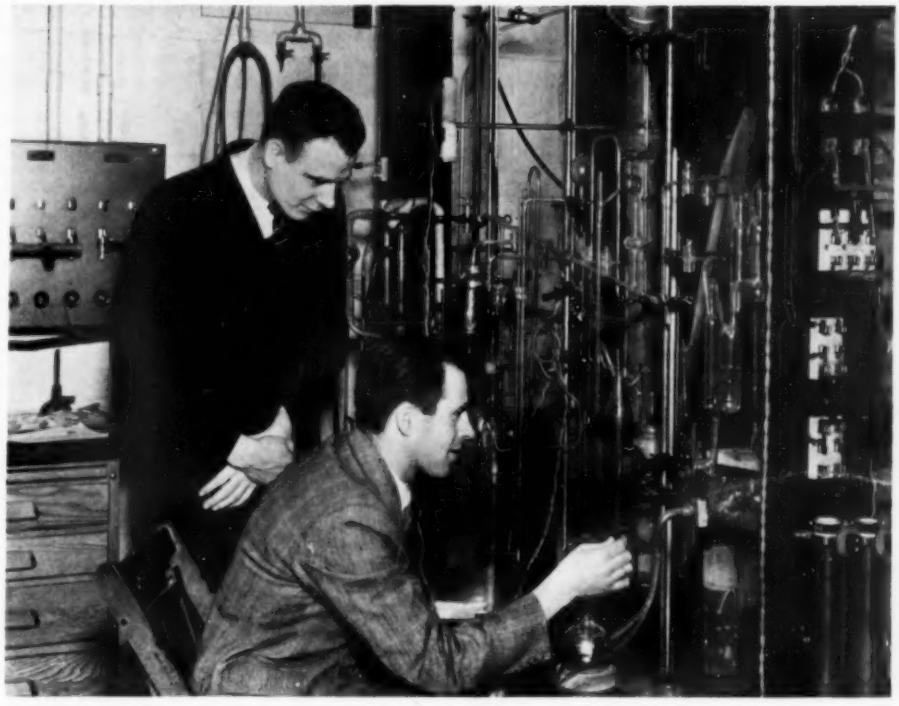
No Substitute Known For Metallurgical Coke

NOTHING now known can be substituted for metallurgical coke, despite the growing use of fuel oils and natural gas, reports Dr. Arno C. Fieldner, U. S. Bureau of Mines fuel expert, reviewing the state of the fuel industry in an address at the University of Maryland.

Coal, once supplying 89 per cent. of the country's fuel energy, and now giving 50 per cent., will in the future again supply most of our fuel energy, says Dr. Fieldner, for our coal reserves greatly exceed our petroleum reserves.

Gasoline from coal, ingenious though the Bergius and Fischer processes are, says Dr. Fieldner, is thermally inefficient, requiring four tons of coal to make one ton of gasoline. Thus, gasoline should not be made from coal until all natural supplies of petroleum are exhausted.

Science News Letter, April 2, 1938



FINDING EARTH'S AGE

Measurements of the amount of radium-derived helium in the rocks tell how old the rocks are, according to present geological theories. This complicated chemical apparatus, operated by Drs. William D. Urry (seated) and Charles S. Keevil (standing) is used in the extraction and measurement of helium from rocks.

GEOPHYSICS

Radium in Meteorites Helps Fix Age of Cosmic Visitors

EXPLODING atoms of radium, giving off helium, lead and energy, now tell scientists the ages of many meteorites which wandered into the earth's gravitational field, later crashing to earth with fiery brilliance.

Some of them, according to figures recently published by Dr. Wm. D. Urry, Massachusetts Institute of Technology physical chemist, who has been analyzing rocks for many years to determine their ages, are less than 100,000,000 years old, while others are as much as 2,800,000,000 years old—about as old as the solar system.

Dr. Urry's analyses, painstakingly made from samples of the meteorite, tell the age of its solidification, and not the time when it fell. Thus, some of these wanderers from space were molten during the age of dinosaurs on earth, while others solidified just as the solar system was being formed.

The oldest meteorites, according to Dr. Urry's figures, could truly be "chips from creation" left over from the great mass of material pulled from the sun when the planets were formed. Others, unles they stayed melted for more than two billion years in the bitter cold of space, could not be leftovers. They must have been formed some other way.

Until recently, it was believed that meteorites were remains of a small planet, or group of planets, whose orbits were beyond Mars. This planet, on breaking up, created the meteorites. Now, with the ages of the meteorites shown to be different, the theory of a disrupted planet may need to be revised.

Many of the stony meteorites show evidence of having been broken and recemented, while others have undergone other alterations just as a rock on earth might in the course of its history. All of the rocks, however, are of the primary type—they were molten once, but none of them resemble earthly sedi-

RECENT VISITOR

This iron fragment from the Canyon Diablo meteorite, which crashed to earth in geologically recent time, and was probably seen to fall by Indians, is about 100,000,000 years old, according to evidence given by the radium, helium and lead it contains.

ments, such as sandstone or shale. The iron meteorites resemble the earth's interior as it has been described by geophysicists, whose instruments tell them facts about places they will never see.

Comets, when they cool and compact into large masses from clouds of luminous dust, are the source of meteorites, according to another theory. Some geologists believe that meteorites do not come from the solar system at all, but that they are wanderers from outer space, attracted into the solar system by the sun's pull, and only incidentally pulled to earth. The new age figures do not solve the riddle of the meteorites, but only show that they are of widely differing ages.

Science News Letter, April 2, 1938

PUBLIC HEALTH

Urges Useful Employment As Mental Health Measure

USEFUL employment—with emphasis on the useful—for all who are able and willing to work was urged as a public health measure by Surgeon General Thomas Parran of the U. S. Public Health Service.

Speaking "as a doctor" before a Senate committee to investigate unemployment and relief, Dr. Parran said:

"Whatever the cost, I would urge that from the standpoint of public health, in its larger concept—of mental health—economic factors are subordinate to the vital necessity of providing for our destitute citizens an opportunity of a livelihood earned by individual effort.

"We cannot for long years and perhaps generations repair losses to human character and mental health which will result from a failure to give useful employment to our citizens."

The vicious circle of poverty-disease-poverty can best be broken, Dr. Parran said, "by doing what we know how to do to improve the health of the underprivileged groups."

He cited figures from the recent Public Health Service survey showing that there is much more illness among the unemployed and much less medical care than among those in more comfortable economic circumstances, and that disease is a large factor in unemployment and unemployability.

Unemployment and economic worry were among the factors causing mental illness and breakdown in as high as one-fourth of first admissions to mental disease hospitals during depression years, according to hospital superintendents' estimates.

Illness and death due to tuberculosis, syphilis, pneumonia and cancer could be greatly reduced, Dr. Parran said, by applying present knowledge to all classes of the population.

Death rates from tuberculosis among the unemployed are now as high as they were for the entire population in 1900. The reduction in the general tuberculosis death rate during the years since 1900 hides the high death rate among lower economic groups.

Science News Letter, April 2, 1938

PUBLIC HEALTH

Peak of Measles Epidemic Not Due For Three Weeks

THE MEASLES epidemic slacked off a bit during the week ending March 19, figures just received at the U. S. Public Health Service show. For this last week the total number of cases, exclusive of Iowa which has not yet reported, was 43,489. This is about 300 cases less than the previous week.

Health authorities do not think the peak of the epidemic has been reached yet, however. Charts of measles reports for the past 9 years show that the totals go up to a high point, then drop slightly for a week and then rise again to the final peak. Only exception to this in 9 years was in 1935 when the peak was reached on March 30. Other peaks usually come about the middle or end of April, after which the epidemic dies out.

That peak week of March 30, 1935, saw the largest number of cases ever reported for a single week, over 35,000.

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●RADIO

April 7, 4:00 p. m., E.S.T.

ORCHIDS FOR YOU—Dr. David Lumsden of the U. S. Department of Agriculture.

April 14, 4:00 p. m., E.S.T.

LOST ARTS OF THE STONE AGE—Dr. H. C. Shetrone, Director of the Ohio State Museum.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

The year 1934, however, had a larger total for the season—242,925 cases for the first 11 weeks of the year. This is the eleventh week of the current year and the total number of measles cases was 330,178.

The number of measles cases reported in Chicago so far this year tops all previous yearly records, the Chicago Board of Health announced. On March 17 the year's total had reached 24,363 cases. Previous record was 24,199 cases during the year 1935. An all-time daily record was set on March 10 with 743 new cases reported in that one day.

Science News Letter, April 2, 1938

NATURAL HISTORY

Tree Grove is Leading Character in New Book

A PRAIRIE grove is the principal character in a new book by Donald Culross Peattie. Books without end have been written that purport to report the world as seen through the eyes of animals. Here is one that uses a natural group of trees as its vantage-point.

Not that the trees are personalized; Peattie is far too clever a writer for that. The grove, one of those "islands" in the primeval prairie's sea of grass that for ages afforded harborage to men and beasts, is simply shown for what it was, a focus for the biota (including the human) of the region round about.

Here came the French: the typical team of the adventurous *sieur* following a dream of empire and the equally vision-inspired priest seeking an empire of souls. Here they wrought among the Indians, until death ended ambition and rewarded zeal. Here the Indians came and went, as the movements of their migratory larder, the bison herds, gave leave and command.

For many years, the long, unrecorded interregnum between French and American pioneers, the grove knew only these bison-following Indians. Even the first white migrants into the region missed it, because they shunned the prairies and would farm only after clearing the timbered bottomlands.

Then at last, on creaking inexorable wheels, the descendants of New Englanders moved in, to found the biotic complex that now dominates the upland prairies. Indian, prairie grass, and bison have gone; American, corn, and cattle have taken the land. The prairie grove, the island of trees, has stood and witnessed it all.

Science News Letter, April 2, 1938

MEDICINE

Yellow Fever Weapon Developed Just in Time

SUCCESSFUL vaccination against jungle yellow fever on a large scale has been achieved by means of a new vaccine developed in the laboratories of the Rockefeller foundation. More than 38,000 persons in Brazil and some 2,000 in Colombia have already been vaccinated, Dr. Raymond Fosdick, president of the Rockefeller Foundation, announced.

Success of the new vaccine is particularly significant because of three recent and upsetting developments: 1. Yellow fever is prevalent in vast areas of the hinterland of both South America and Africa. 2. It can be carried by insects other than the ordinary yellow fever mosquito, but the other carriers have not yet been discovered. 3. Expansion of rapid air travel has brought the yellow fever areas close to regions that considered themselves safe from this disease.

All this means that ordinary methods of fighting yellow fever, which succeeded in wiping out the disease in the United States and many other places, cannot be successfully applied in the case of jungle yellow fever. The only hope of preventing the spread of jungle yellow fever to cities and countries now free of it lies, for the present, in the vaccination of exposed populations and of air crews and passengers.

This now appears possible by means of the new vaccine. This vaccine is made from yellow fever virus developed by tissue culture methods. Reaction to it is mild, consisting chiefly of a slight headache 6 or 7 days after vaccination. Results on 700 persons previously inoculated with living yellow fever virus gave full or partial immunity or protection in over 99 per cent. of the cases.

Science News Letter, April 2, 1938

BIOCHEMISTRY

Viruses, Declared Non-Living, Show Some Signs of Life

SUBMICROSCOPIC particles of proteins that cause the virus diseases of plants and animals are again the subject of discussion: are they alive or not?

For a long time they were considered to be "living molecules." Then they were assigned to the non-living realm, especially as the result of researches in the last couple of years at the Rockefeller Institute laboratories at Princeton, N. J.

Now, Drs. T. E. Rawlins and William N. Takahashi of the University of California indicate several points in which these elusive filter-passing substances persist in acting as though they they were alive. (*Science*, March 18)

One suggestion that they may be living is found in the way they refract or bend light. A similar refraction is produced by living substance in the heads of sperms or male sex cells—which are undoubtedly living objects.

Another point is raised over the chemical nature of the viruses. They are now commonly considered to be enzymes, yet they consist of nucleoproteins. Nucleoproteins are proteins found characteristically in the nuclei of living cells, and not in ordinary enzymes.

Drs. Rawlins and Takahashi also call attention to the enormous molecular weights of the virus proteins. These are figured in the millions, very much higher than the molecular weights of known enzymes. They suggest therefore that instead of being single molecules the virus particles may be aggregates of molecules —another hint that they may be alive after all.

Drs. Rawlins and Takahashi avoid categorical declarations. They state:

"It is obvious that much of the above speculation is based on meager evidence; it is presented with the hope that it may stimulate further research in this field rather than that it may enable the reader to reach a conclusion regarding the nature of viruses."

Science News Letter, April 2, 1938

SYNTHETIC SHELLBIRD

Concocted out of fossil shells as a caricature of a well known geologist, this fantastic fowl was named in honor of its victim, Heterogenus lawsoni, anon.

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in a hunt for dinosaurs in South America, or ice worms in Alaska, will bring a response, sometimes sufficient to enable a doughty warrior to drink himself into a happy stupor, in which he can dream about the strange animals without leaving the safety of his favorite bar.

Tall stories, perhaps, serve a definite need in our present life. Man has always wanted something to wonder at, or to laugh at, and the tall tale satisfies both needs. While most tall tales are told with tongue in cheek, and accepted with a grain or two of salt (taken atop a teaspoonful of the same), there is another group of stories, just as untrue, but sincerely believed by the teller. Under certain conditions, human brains get a trifle out of order. Insanity is not included in this—it is a semi-permanent disorder. When a man is extremely hungry, thirsty, tired, cold, or drunk, his perceptions get a trifle out of order, and he is given to "seeing things" that are not there, in exactly the same manner as a fever patient has hallucinations. Many of these dreams brought on by abnormal hardship seem very real, and are often believed by the recounter, even if by nobody else. When a man collects too many of these unforgettable dreams of things that never happened outside of his own mind, he is locally reputed to be "bushed." Perhaps Jim Bridger's famous tale of the petrified forest in Yellowstone Park, inhabited by petrified birds, who sang petrified songs, had its origin in too much solitude and hardship. Many famous stories have undoubtedly been inspired by the effects of fever or solitude, or hunger.

Some of the wild tales told by travelers are based on some mistaken observation of an actual thing. For example, the legendary mermaid of the South Seas may well have had its origin in a poor observation of a dugong, or sea-cow. To a poor observer a sea-cow might look like a mermaid, particularly if the observer wanted to believe that it was a mermaid.

Somehow, the stories told by the best masters of fiction cannot compare with those found in isolated mining camps and heard from half-crazy miners or prospectors, whose brains have been a trifle addled by long years of hardship and solitude, and then stimulated by liquor. Usually, however, the "bushed" miner has only one story, which he tells over and over, while the composer of fiction has to think up a new one each week.

When the stories of Atlantis cease to attract, someone invents a continent of Mu. And when Mu is thoroughly discredited, another mythical land, inhabited by nonexistent beings, is conjured up by the imaginative, the misinformed, and the mentally-out-of-order, for the edification of the credulous. Somehow, an apocryphal tale is more attractive than the truth and hunting for buried treasure is more attractive than digging in a mine, even though the mine may pay $3 a day regularly, and the buried treasure does not exist.

Guides keep a repertory of tales to tell the annual crop of palefaces. Despite our high degree of general education, some "flatland" woman can always be persuaded to carry her camera open and ready all day, so that she can get a picture of the rackabore to send back home, and each year another tourist is persuaded to sleep in the hotel in a high-country town because of the very dangerous effects of mountain dew.

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Science News Letter, April 2, 1938

PLANT PHYSIOLOGY

Neutron Bombardment Produces Abnormal Growths

BOMBARDMENT of seeds with fast neutrons from a cyclotron produces abnormalities in the leaves and other parts after they sprout, reports Roy Milton Chatters of the University of Michigan. (*Science,* Mar. 18) In some of the leaves one whole side would be missing, in others, normally entire leaves would be deeply lobed, each lobe with a distinct midvein. The cotyledons or seed-leaves were sometimes cleft, and they were usually sprinkled with minute white dots.

The seeds, which included those of evening primrose, cactus, snapdragon and one or two other genera, were exposed alongside the "tank" of the cyclotron, suitably shielded, for periods of from one to nine weeks. Some of them had their germinating capacity considerably reduced, but others showed as high germinating powers after prolonged exposure as they did before.

Science News Letter, April 2, 1938

Books

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BOTANY

NATURE RAMBLINGS

by Frank Thone

Versatile Violets

VIOLETS are among the earliest of our spring flowers. They burst forth with an abundance of blossoms as soon as the returning sun has mellowed the earth even a little, and the rains and thaws of spring have got it properly moist. Like certain ladies, they are just a wee bit fussy about the way they want things, but if those conditions are reasonably well met they are very gracious indeed.

Violets and spring have been associated by poets for so long that we lose track of the plain fact that they can be found in bloom during practically the whole year except the hot months of summer. There is a small but unmistakable crop of violets every autumn, and they can be found blossoming during January thaws even in such regions as Wisconsin and Ontario. Spring is their main flowering season but by no means their only one.

Violets are so often thought of as blue that we forget their wide range of color until we are confronted with white and yellow violets in the field. And the color we call violet is not properly speaking blue at all, but the seventh region of the spectrum, beyond blue—the last of the visible wavelengths at its shortwave end.

While most violets stick to one color with reasonable consistency, contenting themselves with, at most, white bases on blue petals or violet-colored veinings in white ones, there is at least one species that combines all three of the violet's principal hues in one flower. This is the tricolor violet, a much-developed cultivated form of which is better known to us as the pansy.

Again, we so habitually think of violets as flowers of the woods that it is a perennial surprise to find many species that refuse to grow in the shade of trees at all, and disport themselves in the open. Some of them insist on the wetness of marshes. Others, especially in the West, will grow only on well-drained, open soil, often on the coarsest of gravelly hillsides, in the company of the hardiest herbs and grasses.

With this great versatility and adaptability, it is not surprising to learn that there are many species of violet: at least 300, of which about 80 are native to this continent.

Science News Letter, April 2, 1938

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INVENTION

Non-Glare Auto Lights May Come as Patent Tangle Clears

HIGHLY important news for glare-blinded night-driving motorists is contained in the announcement that the conflict over patent rights on the use of polarized materials for automobile headlights has at last been cleared.

The Polaroid Corporation, manufacturers of sheet polarizing material which is finding wide applications, has acquired the basic patents of Dr. L. W. Chubb for the use of any polarizing material in headlights. Dr. Chubb is director of research of the Westinghouse Electric and Manufacturing Company, but the patents were those of Dr. Chubb personally.

Previously the application of polarizing material in headlights, to eliminate the hazardous glare at night, has been at an impasse. Dr. Chubb had the patents on the use of materials for this purpose and had demonstrated headlights so equipped. The trouble, in the past, was that the materials which could be used were highly expensive and such headlights would have cost as much as $100 or more.

Edwin H. Land, young Boston scientist who formed the Polaroid Corporation, had invented the cheap, easy-to-make, sheet Polaroid material but was unable—because of the Chubb patents—to apply it to its most valuable use in automobile headlights.

The present pooling of Chubb and Land patents with control vested in the Polaroid Corporation was accomplished by a transference of stock to Dr. Chubb and his associates.

Polaroid was originally invented to solve the headlight problem but while the patent tangle was being unravelled it found wide use in sun glasses, photographic and scientific equipment.

As foreseen by scientists, non-glare headlights will some day be standard equipment on all motor cars. The headlights of each car would polarize the light they emit in a single plane. This plane-polarized light vibrates in a single direction instead of in all directions.

In the windshields of other cars, or in special driving glasses, would be other polarizing material which is "crossed" with the material in the auto headlights. This "crossing" prevents the headlight rays from coming to the eyes of the other driver. Instead of a blinding glare which motorists know so well the oncoming car shows only two blue-purple glows for its headlights and the outline of the approaching car is revealed by the lights of the motorist's own car. Driving highways at night in a glaring splash of blinding light would change and become comparable with driving down a lonely moonlit road, as far as visibility is concerned.

Now that the patent worries over the application of non-glare headlights have been surmounted there comes the problem of installation. Concededly, this will come slowly for the system only works when both the headlights and the windshields of the two cars have the installation of "crossed" polarizing materials.

Which means that if you, as an individual driver, install polaroid headlights alone your night-driving problems will not be solved unless other cars have similar installations also.

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•First Glances at New Books

Physics

THE EVOLUTION OF PHYSICS: THE GROWTH OF IDEAS FROM THE EARLY CONCEPTS TO RELATIVITY AND QUANTA —Albert Einstein and Leopold Infeld—*Simon and Schuster,* 319 p., $2.50. Seldom does the lay reader have the chance, even in book form, to have an outstanding scientist sit down and chat with him about the happenings in that amazing world of atoms, energy, light and the universe which is the province of modern physics. Prof. Einstein and Dr. Infeld do not baffle the reader with the complex formulae which they might so easily have thrown in. As they put it, "The book is a simple chat between you and us."

Science News Letter, April 2, 1938

Technology

SYMPOSIUM ON CONSISTENCY. CRITICAL DISCUSSION ON PRESENT-DAY PRACTICES IN CONSISTENCY MEASUREMENT—*Amer. Soc. for Testing Materials,* 73 p., 85 c. Reprint of the nine papers presented at the symposium sponsored by the A. S. T. M. at its meeting in New York City on June 29, 1937.

Science News Letter, April 2, 1938

History

THEN CAME OIL: THE STORY OF THE LAST FRONTIER — C. B. Glasscock — *Bobbs-Merrill,* 349 p., illus., $3. The human story behind the oil booms. Interesting tales of the early days in the oil country — Oklahoma and the Indian Territory — written in a conversational narrative style.

Science News Letter, April 2, 1938

Engineering

ROADSIDE DEVELOPMENT—Joint Comm. of State Highway Officials and the Highway Research Board—*Highway Research Board, National Research Council,* 52 p., 25 c.

Science News Letter, April 2, 1938

Physics

SPECTROSCOPY IN SCIENCE AND INDUSTRY. PROCEEDINGS OF THE FIFTH SUMMER CONFERENCE ON SPECTROSCOPY AND ITS APPLICATIONS HELD AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASSACHUSETTS, JULY 19-22, 1937 —*Wiley,* 134 p., $3.

Science News Letter, April 2, 1938

Plant Physiology

PLANT CHEMICULTURE: A GUIDE TO EXPERIMENTS IN GROWING PLANTS WITHOUT SOIL (2d ed.)—C. D. Dawson and M. V. Dorn—*Published by authors, Los Angeles, Calif.,* 110 p., illus., $1. Tray agriculture, as it has been popularly named, is attracting much attention, and many persons want to try their hands at it. Success (if measured in cash profits) can hardly be guaranteed; but if the pursuit of a fascinating hobby is sufficient reward, the thing may be undertaken. This little book tells what materials to use, and how to use them.

Science News Letter, April 2, 1938

Biography—Physiology

CLAUDE BERNARD, PHYSIOLOGIST—J. M. D. Olmsted—*Harper,* 272 p., $4. For the first time in this century, the English-speaking public can read the story of the life and accomplishments of one of the world's greatest physiologists whose influence is still felt in medicine and related sciences.

Science News Letter, April 2, 1938

Physiology

ON A NEW GLAND IN MAN AND SEVERAL MAMMALS (GLANDULAE PARATHYREOIDEAE) — Ivar Sandström; Carl M. Seipel, tr.—*Johns Hopkins,* 44 p., illus., $1. This is the first translation of Sandström's original account of his discovery, in 1877, of the parathyroid glands. Medical scientists who could not read the original Swedish have heretofore had to rely on two short German abstracts or translations from these, so the present volume will be widely welcomed in scientific circles. With the translation is a note on Sandström's life written by Dr. Johan August Hammar, professor emeritus of Anatomy in the University of Upsala.

Science News Letter, April 2, 1938

Medicine

A HISTORY OF WOMEN IN MEDICINE FROM THE EARLIEST TIMES TO THE BEGINNING OF THE NINETEENTH CENTURY —Kate Campbell Hurd-Mead—*Haddam Press,* 569 p., illus., $6. Women especially will be interested in this account of the achievements of their sex in the medical field. It is a little disappointing, perhaps, to find the record closes at the beginning of the 19th century, but the book is crowded with interesting information on earlier times.

Science News Letter, April 2, 1938

Medicine

PNEUMONIA AND SERUM THERAPY (Rev. ed.)—Frederick T. Lord and Roderick Heffron — *Commonwealth Fund,* 148 p., $1. Important handbook for physicians and health authorities.

Science News Letter, April 2, 1938

Geography

AMERICAN GUIDE SERIES: U. S. ONE, MAINE TO FLORIDA—Federal Writers' Project of the W.P.A., comp.—*Modern Age Books,* 344 p., illus., 95 c. Backseat drivers can improve their minds and have a wonderful time with this excellent little handbook, intended for motorists who ride up and down the eastern coast. It follows the route exactly, giving facts useful to the tourist, and enriching the trip by brief pointers on history and legend.

Science News Letter, April 2, 1938

Language

THE STORY OF THE ALPHABET (New ed.) — Edward Clodd.— *Appleton-Century,* 209 p., illus., $1.25. A popular account of the evolution of writing, in a new edition. A new foreword hints at recent archaeological discoveries bridging gaps in the pre-alphabet and alphabet eras. But the main body of the volume has not been revised to include this significant, though still controversial, material.

Science News Letter, April 2, 1938

Ethnology

THE APACHE INDIANS — Frank C. Lockwood—*Macmillan,* 348 p., $3.50. The name Apache stands for savage cruelty, defiance, and cunning. Few people, however, know the epic story of these remarkable Indians, from their mysterious appearance in the Southwest down through their era of conflict with Uncle Sam, and their present state of wearing barbershop haircuts and cowboy hats. Dr. Lockwood tells the story with due regard for the Indian's side.

Science News Letter, April 2, 1938

Medicine

THE CONQUEST OF CHOLERA: AMERICA'S GREATEST SCOURGE—J. S. Chambers —*Macmillan,* 366 p., illus., $4.75. An exciting, dramatic story of disease fighting, told in easily read style. The conquest of cholera epitomizes the history of scientific disease fighting.

Science News Letter, April 2, 1938

Natural History

A PRAIRIE GROVE—Donald Culross Peattie—*Simon and Schuster,* 289 p., $2.50. (See page 221).

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Music—Archaeology

THE MUSIC OF THE SUMERIANS, BABYLONIANS AND ASSYRIANS — Francis W. Galpin — *Cambridge* (*Macmillan*), 110 p., plates, $7.50. (See page 216).

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